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**MAINTAINING THE CIVIL RESERVE AIR FLEET**

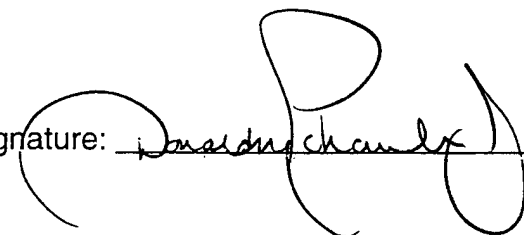
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The contents of this paper reflect my own personal views and are not necessarily  
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## **Abstract of Maintaining the Civil Reserve Air Fleet**

Strategic airlift is vital to meeting the National Security Strategy of protecting the nation's interests throughout the globe. With a decreasing defense budget, the CRAF program is a proven method to provide DoD a relatively inexpensive way to maintain a large airlift capability. This paper investigates and analyzes the thesis that the shift in global business practices and a robust economy, combined with CRAF activation concerns, endangers the future of the CRAF program. Section One begins with a historical overview and current status of the CRAF program. Section Two analyzes two core problems (decreased financial reliance upon DoD and increased likelihood of CRAF activation) generated within the civil air carrier industry and military by recent shifts in both the economic and political environment. Section Three provides recommendations to counter these problems and improve the relationship between DoD and civil air carriers. Finally, Section Four examines areas requiring future study that may potentially prove instrumental in addressing the future of CRAF.

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## **Introduction**

With the downsizing of the U.S. military and changing global environment, the requirement for strategic airlift continues to grow. Since 1951, the CRAF (Civil Reserve Air Fleet) program has been instrumental in augmenting the nation's military organic airlift capacity with commercial air assets during times of war or national emergency. While there is little debate over the vital importance of continued participation in the Department of Defense (DoD) sponsored CRAF program, recent developments within the program must be addressed.

A dramatic shift in both the national economic and political environment has acted as a catalyst in generating two core problems affecting both the civil air carrier industry and military, possibly jeopardizing future CRAF participation and utilization. The first problem is a recent shift in global business practices and a robust economy that combine to make the civil air transportation industry increasingly stable and profitable, decreasing their financial reliance upon the DoD. The second problem is the presumption of the civil air carrier that the likelihood of CRAF activation and the possible risks associated are increasing. The two core problems are closely tied and are causing a sort of "double jeopardy" for the DoD. They are causing an estrangement between the civil air carriers and DoD, while at the same time jeopardizing the military's assured access to CRAF capabilities. This paper investigates and analyzes the thesis that the shift in global business practices and a robust economy, combined with CRAF activation concerns, endangers the future of the CRAF program. The paper suggests possible recommendations to counter these problems and improve the future of the CRAF program.

Although numerous strategic airlift studies have been written throughout the years, they primarily focused upon CRAF in terms of specific mobility requirements or incentive programs. Little academic attention has been directed toward addressing the problems and their interrelationship between the civil air carriers and the DoD during these changing and dynamic times. This paper stems from an analysis of published and unpublished research papers, trade magazine articles, government and political speeches, and personal research and insight. It ultimately contends that both the civil air carriers and military are developing and instituting dramatic changes in the way they will conduct business in the future. The cumulative effect of all these changes will be an environment where the military is increasingly reliant on CRAF, yet its availability is likely to be less.<sup>1</sup>

### **Section One: CRAF Overview**

To gain a better appreciation of the CRAF concept and its possible future, it is necessary to understand its history. The sole purpose for the creation of the CRAF program in 1951 was to augment organic airlift forces with civil passenger, cargo, and aeromedical capabilities during times of crisis.<sup>2</sup> Participation in the CRAF program has always been strictly voluntary. The program is open to any U.S. registered air carrier capable of maintaining minimum long-range international fleet commitment levels (30 percent for passenger and 15 percent for cargo) with committed aircraft capable of over-water operations of at least 3,500 nautical mile range and 10 hours per day utilization rate.<sup>3</sup> Carriers must also commit and maintain at least four complete crews for each aircraft.<sup>4</sup> The flight crews must all be U.S. citizens so they can be eligible to be granted temporary security clearances during CRAF activation.<sup>5</sup>

Commitment to CRAF entitles civil air carriers a share of the DoD's passenger and cargo airlift contracts and incentives. These contracts are dispersed among the carriers depending upon the number and type of aircraft they have enrolled.<sup>6</sup> Between 1989 and 1996, AMC contracted an average of \$536 million per year worth of airlift business to CRAF participants.<sup>7</sup> Additionally, there are numerous unguaranteed yearly contracts that can bring the total over \$700 million.<sup>8</sup> The CRAF program continues to maintain 100 percent voluntary enrollment with 41 carriers and 722 aircraft enrolled as of September 1999.<sup>9</sup>

There are three stages for the activation of CRAF depending upon the severity of the crisis: (1) Stage I (Committed Airlift Expansion); (2) Stage II (Defense Airlift Emergency); and (3) Stage III (National Emergency).<sup>10</sup> CRAF utilization within these stages is structured from the guidance established in the Mobility Requirements Study Bottom Up Review (MRS BURU).<sup>11</sup> MRS BURU was conducted for Joint Chiefs of Staff in 1995 to develop the military's mobility requirements in a CONUS-based posture with the possibility of a Two-Major Theater War (Two-MTW) scenario. It was determined that strategic airlift capability of 49.7 MTM/D (Million Ton Miles/Day) is required to support the two near-simultaneous MTW. Under the conditions set by MRS BURU, the CRAF program provides approximately one-third of this total airlift to support the Two-MTW scenario<sup>12</sup> (The Joint Chiefs of Staff began their work on an updated study, Mobility Requirements Study 2005 or MRS-05, in October 1998 and have a scheduled release date during FY00).<sup>13</sup>

At an approximate cost to American taxpayers of \$200 million per year, the CRAF program offers DoD a relatively inexpensive way to gain a large percentage of

airlift capability at minimum cost.<sup>14</sup> It is estimated that it would cost over \$50 billion to procure, and \$1-3 billion annually to operate, an equivalent-sized organic fleet of aircraft to maintain the same MTM/D capability that the CRAF program provides.<sup>15</sup> Annual cost in dollars per ton-mile per day for CRAF is less than \$12, while the same capability in the organic fleet is \$152, thus allowing the DoD to maintain a very substantial airlift force for a relatively small cost.<sup>16</sup> This small cost equates to, when fully activated, the CRAF fleet accounting for 93 percent of total passenger capacity, 32 percent of total cargo capacity, and 50 percent of medical patient lift.<sup>17</sup> Overall, CRAF contributes 35 percent of AMC's total airlift capability, or roughly 17 MTM/D.<sup>18</sup>

The only time the United States was required to activate CRAF provides superb testimony to its value and capabilities. During the 1990-91 Persian Gulf War, CRAF moved 62 percent of the passengers and 27 percent of the cargo for the deployment and 84 percent of the passengers and 41 percent of the cargo for the redeployment.<sup>19</sup> However, both during and after the Gulf War, the military and civil air carriers came to a sober realization of the responsibilities, consequences, and problems associated with CRAF.

## **Section Two: Analysis of Problems**

### **Inherent Problems**

Although the purpose of this paper is to identify and analyze two new core problems facing CRAF, it is important to recognize other inherent problems within the program. Addressing them will provide a better picture of the overall situation facing CRAF and expose those areas that contribute to compounding the two core problems. The civil air carriers have identified force protection, insurance, incompatibility with



military loading/unloading equipment, and C2 (command and control) as continuing problems within the program.<sup>20</sup> Although these inherent problems have not yet affected CRAF enrollment, the DoD and civil air carriers are currently working these issues and developing solutions addressing each parties concerns.

### **Core Problem 1: Global Business Practices and Economy**

Unlike the inherent problems listed above, the recent and dramatic shifts in both the economic and political environment have generated two core problems within the civil air carrier industry and military that are not as apparent or easily understood. The first problem is the recent shift in global business practices and a robust economy that combine to make the civil air transportation industry increasingly stable and profitable, decreasing its financial reliance upon DoD. Two underlying changes in business practices combine to bolster the air transportation industry as a whole. First, civil aviation has embraced a new and innovative logistical strategy referred to as “just-in-time”.<sup>21</sup> Second, established market shares are becoming increasingly stable and profitable for the first time since deregulation of the industry in 1978.

#### **Global Business Practices and Economy: “Just-in-Time” Strategy**

Aided by new technology and computers, the business industry has transitioned to a “just-in-time” logistics strategy. The “just-in-time” strategy is based on the air transportation industry to provide the rapid delivery of goods and supplies to businesses exactly “when” and “where” there required. Once normally reserved for high-value or fragile goods, the reduction in inventory, facility, and production costs achieved by adopting the “just-in-time” strategy allow even low-value goods to be shipped profitably

by air.<sup>22</sup> To remain competitive within the new global economy, many businesses are realizing that they must adopt this "just-in-time" strategy that sparks a huge demand for air transportation assets. Where once air service was reserved for only high value products, the air transportation industry is finding an entire economy and business practices structured around the service only they provide. The impact on the DoD is a civil air carrier industry that is growing less reliant on government business and views possible activation as detrimental to its survival. For the first time, the military has found itself in direct competition for civil airlift assets. In addition, with an economy based primarily on the air transportation industry, the consequences of CRAF activation may prove devastating.<sup>23</sup>

#### Global Business Practices and Economy: Air Carrier Deregulation

The government has always had a stake in maintaining a healthy civil aviation industry for military, economic, and political reasons. Since deregulation, the government has provided many incentives to the airlines. The current robust economy is beginning to reward surviving air carriers with lower fuel prices, low inflation, firm and stable markets, and an increasingly loyal clientele base.

To become competitive and survive in the deregulated environment, the carriers were forced to find ways to operate more efficiently. Many civil air carriers moved away from the larger wide-body aircraft and transitioned to a smaller fleet. Smaller aircraft are better suited for "hub and spoke" operations and offer the air carriers greater flexibility and lower operating cost due to increased fuel efficiency and standardization.<sup>24</sup> A smaller civil air carrier fleet directly impacts the military in the number of wide-body-equivalents (WBE) such as the Boeing 747, the basis for MRS BURU calculations and

the most "military useful" aircraft. Since 1990, the number of 747's operating by U.S. based carriers has been decreasing approximately 3 percent a year.<sup>25</sup>

In addition to changes in the physical composition of their fleets, there has been an increase in foreign influence, mergers, and investment among the civil air carrier industry. Mergers were initially formed primarily for financial survival or to eliminate a competitors, but recent mergers are forming to establish market shares and monopolies throughout the globe.<sup>26</sup> Under the current rules of the CRAF program, the civil air carrier must be American owned (majority share) to be eligible to participate.<sup>27</sup> Continued mergers of domestic air carriers with those of foreign ownership could severely limit the air assets available to the CRAF program. Growing international carriers such as Dutch owned KLM and Richard Branson's Virgin Airlines, who are currently establishing large market shares of both international and domestic business, are ineligible to participate in CRAF.<sup>28</sup>

## **Core Problem 2: Activation Probability**

A second potentially crippling problem is the presumption of civil air carriers that the likelihood of CRAF activation and possible risks associated are increasing. With the collapse of the Soviet Union, the National Security Strategy has shifted from one of containment to one of global engagement.<sup>29</sup> Along with the shift in strategy came the downsizing of the military for cost-savings. Currently the military has approximately 1/3 less people and 66% fewer overseas bases than it had during the Cold War years.<sup>30</sup> While downsizing continues, the military is deploying four times more than just ten years ago as it finds itself increasingly committed to operations involving humanitarian relief, peacekeeping, and peace enforcement.<sup>31</sup>

To meet these demands, the military requires a CONUS-based airlift force that is more agile, faster responding, and able to deploy greater distances. One major problem compounding this challenge is the fact that the military airlift fleet is approaching its service life. The 254 C-141s in the inventory are scheduled to be phased out in 2006 while slowly being replaced with 120 C-17s, the first new airlift aircraft in the military inventory in over 28 years.<sup>32</sup> Also of concern are the recent maintenance problems and 14 percent drop in the utilization rate of the C-5<sup>33</sup>. Currently the military does not possess, even with full CRAF participation, the assets to meet the requirements set forth by MRS BURU and the Two-MTW scenario.<sup>34</sup>

The commercial air industry's concern stemming from the Gulf War and the changing missions of the military is the fear of possible threats to its assets. With the Cold War strategy, air carriers could operate well behind the threat. Scud missile attacks, along with the constant threat of chemical agents, provided a wake-up call to CRAF participants during the Gulf War. Many carriers quickly realized that the nature of war has and will continue to change, placing their valuable assets at greater risk.

A National Security Strategy based on global containment while using a smaller force with dwindling resources that has seen its deployments increase four fold may be a recipe for disaster in the eyes of many civil air carriers. The civil air industry, as mentioned earlier, is finally experiencing stability that it has not seen in over twenty-two years, while their reliance on DoD financial support and contracts is waning. Just as the military developed a new strategy as the global environment changed, civil air carriers are reexamining their future strategy. With the ingredients listed above, many carriers are viewing the CRAF program as an increasing liability.

### **Section Three: Recommendations**

The 21<sup>st</sup> century finds the civil air carrier industry experiencing unprecedented growth while, unfortunately, the military continues to struggle with a shrinking budget and an ever-changing global environment. The problems discussed above may prove to be crucial when examining the future of the CRAF program and its participants. The challenge for the DoD is in discovering, articulating, and implementing new ideas and programs that will minimize negative effects on civil operations while at the same time strengthening relationships between the government and air carriers in order to meet future mobilization requirements.<sup>35</sup>

Several recommendations may provide viable options and solutions to the above mentioned CRAF problems. These recommendations can be categorized as either having a direct or indirect impact depending upon the focus, avenue, or course of action endorsed to address the problem.

#### **Direct Impact: CRAF Stage Modification**

The current 3-stage activation process was not the initial concept. In 1963, the CRAF program underwent a modification due to commercial carrier concerns that activation would remove too large of a percentage of their assets from the civil sector.<sup>36</sup> With the increased likelihood of CRAF activation, many carriers are once again uncomfortable with the 3-stage activation process. The question is whether the U.S. could handle the many different costs (economic, political, military) associated with a Stage III activation? Several recent studies have concluded that Stage III is no longer a viable option due to the possible adverse effects.<sup>37</sup> The economic strain on the public,

civil air carriers, and global economy would be severe.<sup>38</sup> Increased risk of activation and studies such as these will deter future CRAF enrollment unless acceptable alternatives can be found.

A current study by the Logistics Management Institute (LMI) suggests replacing the current 3-stage program with one containing eight segments that currently match the types of aircraft operated by the civil air carriers. The LMI's segments are: (1) long-range international, passenger; (2) short-range international, passenger; (3) long-range international, cargo; (4) short-range international, cargo; (5) long-range aeromedical evacuation; (6) short-range aeromedical evacuation; (7) Continental United States; and (8) Alaskan.<sup>39</sup> Adopting the segmented approach would make CRAF participation more attractive by allowing the airlines to commit to specific segments, mating their assets more efficiently, increasing their flexibility, and reducing possible negative economic consequences.<sup>40</sup>

In defense of retaining the current system is the fact that under the MRS BURU scenario, the nation would incur substantial risk in its ability to fulfill the Two-MTW strategy. Adopting an eight segment system or otherwise modifying the current three stage system could increase the risk in the halting phase of a second MTW, cede the initiative to the enemy for a longer period, raise casualties, and extend the time required to fight both MTWs.<sup>41</sup>

#### **Direct Impact: Improved Incentives**

The CRAF program is primarily a business venture, designed to offer direct monetary compensation for the use of civil aircraft for military purposes. Monetary incentives and compensation have kept the program at 100 percent enrollment since

the early 1950s. To counter growing reluctance of civil air carrier participation in CRAF, the program must remain a monetarily appealing program. Improved monetary compensation, incentives, and bonuses could include: (1) activation bonuses; (2) down time / wait period pay; (3) tax breaks; (4) mission type incentives; (5) low cost loans;<sup>42</sup> (6) bonuses for specific size and type of aircraft; (7) cash payments for CRAF enrollment;<sup>43</sup> (8) no cost war-risk insurance;<sup>44</sup> (9) surcharge for CRAF activation.<sup>45</sup> Being the foundation of the CRAF program, improvements in this area would reap the greatest gains in ensuring continued CRAF enrollment.

The drawback to the direct approach of “throwing more money at the problem” is the very reason the military continues to downsize: lack of funding. With DoD operations on a fixed budget, increased compensation would likely take money directly from military coffers, compounding the problem. In these times of limited financial funds, perhaps indirect compensation would prove more viable with fewer implications.

### **Indirect Impact: Increased Prepositioning**

There is little debate on the importance of prepositioned equipment. The concept of prepositioning equipment combines the best attributes of airlift and sealift: speed and volume. Through prepositioning, heavy combat equipment and supplies ashore and afloat reduce the time required to deploy forces to distant regions and the number of airlift sorties devoted to moving such supplies.<sup>46</sup> In fact, MRS BURU recommended that more equipment be prepositioned afloat to ensure any initial advance could be halted.<sup>47</sup>

Additional prepositioning of equipment would address both core problems. First, with more prepositioned equipment located throughout the globe, the military would require less civil airlift augmentation during times of national emergency or war, thus

lowering the likelihood of CRAF activation. Additionally, prepositioned equipment would require transportation to and from the staging location, periodic maintenance, and occasional replacement: a lucrative business that could be linked to CRAF participation.

Two arguments against increased prepositioning are high cost and decreased flexibility. First, the initial cost to purchase equipment is expensive and requires continuous monitoring and maintenance while advances in technology quickly make it obsolete. Second, an argument can be made that prepositioning reduces the theater commander's flexibility to alter his required equipment and airlift flow. Although both arguments may have some validity, the cost of prepositioned equipment compared to the possible consequences to national security is negligible.<sup>48</sup> Also, the loss of flexibility to the theater commander has been calculated to diminish by only 2 percent, an acceptable loss in the view of the JCS.<sup>49</sup>

### **Indirect Impact: Adopting New Logistics / Technology**

DoD's increased reliance on civil air carriers for airlift should be a warning flag that its operations must be streamlined. The military needs to adopt new technologies and a logistics strategy that reduces logistical response time, logistics footprint, and infrastructure, while integrating private sector technologies.<sup>50</sup>

New technology such as bar coding, "smart cards", optical, satellite, and web based tracking is available and currently being utilized to increase efficiency and movement control within the civil transportation industry.<sup>51</sup> In military terms, application of this new technology is enhancing C4 (command, control, communication, and computer). An example of how an updated C4 structure could improve the military is a deployable 100-person Air Operations Center (AOC) that normally requires 1,000



people to operate. The end result is a single C-17 airlift sortie instead of ten.<sup>52</sup> To maximize the benefits of new technology, an updated logistics strategy is clearly required.

Currently, the military logistics environment is in transition from an archaic “just-in-case” strategy to a modified “just-in-time” concept. A hybrid combination of both systems has been adopted by DoD and is referred to as a “just-right” strategy.<sup>53</sup> This change is dependent upon rapid delivery of essential parts and supplies by using air transportation to reduce delivery time, again benefiting DoD through savings in both time and money.

By adopting this new logistics strategy and integrating civil air carrier technology systems, DoD is making headway in offering more available contracts to CRAF members while simultaneously decreasing the possibility of activation due to reduced airlift requirements.<sup>54</sup> The downside to this “just-right” system is again increasing dependency upon the civil air carriers while possibly exposing the military supply system to possible critical failure in the event of CRAF activation.<sup>55</sup>

### **Miscellaneous**

Some recommendations fit neatly into neither the “direct” or “indirect” category. An easy approach, and arguably one that may reap the most rewards, is the DoD lifting or easing certain self-imposed restrictions and regulations while allowing more flexibility in day-to-day operations within CRAF.

Crew related issues include the requirement for air carriers to provide four crews per aircraft and limit duty-day length. Easing these requirements would make the program more amenable to many civil air carriers.<sup>56</sup> As with the military, civil air

carriers rely heavily on the employment of reserve officers to pilot their aircraft. A reduction of crew requirements would open a larger pool of available pilots. Safety concerns always dominate crew related issues, but if properly addressed, safety would not be jeopardized.

Day-to-day operations could be improved by allowing CRAF carriers to use their own hubs, preferably near the deployment areas, for possible CRAF staging points.<sup>57</sup> This would save them both time and money by allowing them to operate at a familiar location and use their own equipment. Benefits would also include improved safety, reduced military training requirements, and less congestion at military installations.<sup>58</sup> A decrease in flexibility and cargo control for the military would be a disadvantage.

Finally, a program that was recently given legislative approval, and could be expanded, allows CRAF participants to conduct commercial operations from selected military airfields.<sup>59</sup> Programs such as these save the civil air carriers money, decrease fuel costs, and add flexibility to their scheduling.

#### **Section Four: Further Study Required (EAF Integration)**

Recent changes within the military and global environment forced fundamental and evolutionarily change within the Air Force in an attempt to address many of the same issues currently facing the CRAF program. The Expeditionary Aerospace Force (EAF) concept was the result of this change. The EAF reshaped the Air Force into a leaner, more adaptive and deployable force consisting of ten predetermined packages of aircraft, equipment, and personnel called Aerospace Expeditionary Force's (AEFs). Each AEF is eligible for a 90 day deployment every 15 months.<sup>60</sup> Key to the AEF concept is that it is a blend of active duty, Guard and Reserve forces, and would only

fully deploy in times of national emergency. Can DoD integrate the EAF concept into CRAF in an attempt to address future problems?

The possible benefits of CRAF and EAF integration may include:

- (1) improved long range planning (a set rotational schedule; predictable and stable schedules for training and maintenance; ability to avoid down times and conflicts with high traffic periods i.e. holidays)
- (2) air carrier flexibility (the ability to swap and cover for other carriers in certain circumstances; ability to select region to support; improved equipment integration with military)
- (3) reserve pilot deconfliction (increased availability of pilots while decreasing possible conflicts between civil air carrier and military demands)
- (4) integration (a seamless transition during activation; continuous exercising of systems and processes)
- (5) increased force protection (air carriers integrated into combat teams)

### **Conclusion**

Strategic airlift is vital to meeting the National Security Strategy of protecting the nation's interests throughout the globe. The CRAF program is a proven method to provide DoD a relatively inexpensive way to maintain a large airlift capability at minimum cost. As the United States continues to maintain the most capable strategic airlift system in the world, the recent shift in the economic and political environment has combined to generate new problems that may jeopardize the future of this vital program. This paper explored two core problems of potentially grave impact upon the CRAF.

Both direct and indirect recommendations were presented to attack the problems while strengthening the program.

While many research projects have been conducted on the CRAF program, few address the current friction between the DoD and civil air carriers caused by the changes in the global political and economical environment. This paper has provided only a brief overview of key problems facing CRAF. Failure to continuously focus on the airlift contributions provided by the CRAF program will jeopardize the nation's ability to protect and defend its national interests both home and abroad.

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<sup>3</sup> Mary Chenoweth, The Civil Reserve Air Fleet: An Example of the Use of Commercial Assets to Expand Military Capabilities During Contingencies (Santa Monica, CA: RAND Corporation, 1990), 6.

<sup>4</sup> Marc S. Howard, "Civil Reserve Air Fleet—Do We Still Need It?" (Unpublished Research Paper, Army War College, Carlisle Barracks, PA: 19 March 1996), 14.

<sup>5</sup> Alfred Beyer and others, Review of DOD's Mobility Program: Civil Reserve Air Fleet (Bethesda, MD: Logistics Management Institute, May 1991), 21.

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<sup>7</sup> James P. Sturch, "Strategic Airlift: Strengths and Weaknesses," (Unpublished Research Paper, Army War College, Carlisle Barracks, PA: 7 April 1999), 12.

<sup>8</sup> Howard, 10.

<sup>9</sup> "Civil Reserve Air Fleet (CRAF) Allocation," Lkd. Department of Transportation: Office of Emergency Transportation at "August 1999 OET/CRAF Monthly Allocations," ([http://www.rspa.dot.gov/oet/enclos1\\_899.html](http://www.rspa.dot.gov/oet/enclos1_899.html))/> 29 November 1999), 1.

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<sup>15</sup>Congress, Senate, Seapower Committee, Force Structure Impacts on Fleet and Strategic Lift Operations, Hearing before the Armed Services Committee, 13 October 1999, 6.

<sup>16</sup>Sturch, 12.

<sup>17</sup>"Mobility Forces," Lkd. 1996 Annual Defense Report at "Executive Security Page," ([http://www.dtic.mil/execsec/adr96/chapt\\_21.html](http://www.dtic.mil/execsec/adr96/chapt_21.html)> 12 Dec 1999), 5.

<sup>18</sup>Chenowith, 9.

<sup>19</sup>Sturch, 10.

<sup>20</sup>Christopher J. O'Dell, "An Operational Look at the Issues Involved in the Decision Between Military and Civilian Airlift Operations," (Unpublished Research Paper, AFIT, Wright-Patterson AFB, OH: May 1997), 46.

<sup>21</sup>Daly, 25.

<sup>22</sup>"Defense Transportation – Among Many Challenges, The Quest for Intransit Visibility," Lkd. USTRANSCOM at "United States Transportation Command PODIUM PAPERS," (<http://public.transcom.mil/speeches/ndtadcnc.html>> 5 December 1999), 5.

<sup>23</sup>O'Dell, 43.

<sup>24</sup>Howard, 16.

<sup>25</sup>Post, 23.

<sup>26</sup>Howard, 16.

<sup>27</sup>Chenowith, 6.

<sup>28</sup>"Foreign Ownership Issue Divides Panelists at Aviation Symposium," Aviation Daily, 5 May 1999, 212.

<sup>29</sup>"An Introduction to the Expeditionary Aerospace Force," Lkd. Air Force Link at "Expeditionary Aerospace Force Page," (<http://www.af.mil/eaf/intro.html>> 27 January 2000), 1.

<sup>30</sup>Ibid.

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<sup>31</sup>Ibid., 2.

<sup>32</sup>Sturch, 8.

<sup>33</sup>"An Introduction to the Expeditionary Aerospace Force," 1.

<sup>34</sup>Walden, 9.

<sup>35</sup>Beyer, 29.

<sup>36</sup>Donovan, 12.

<sup>37</sup>Mark W. Graper, "Civil Reserve Air Fleet Stage III: Viability and Implications," (Unpublished Research Paper, U.S. Naval War College, Newport, RI: 1998), 14.

<sup>38</sup>O'Dell, 43.

<sup>39</sup>Donald W. Warner, "Strategic Airlift: Can the C-17 Fill the Requirement?" (Unpublished Research Paper, Army War College, Carlisle Barracks, PA: April 1998), 20.

<sup>40</sup>Ibid.

<sup>41</sup>Graper, 14.

<sup>42</sup>Howard, 21.

<sup>43</sup>Post, 38.

<sup>44</sup>Howard, 15.

<sup>45</sup>Sturch, 22.

<sup>46</sup>U.S. General Accounting Office, Military Airlift: Options Exist for Meeting Requirements While Acquiring Fewer C-17s, Chapter Report NSIAD-97-38, (Washington, D.C.: February 1997), 19.

<sup>47</sup>Ibid.

<sup>48</sup>Walden, 16.

<sup>49</sup>Military Airlift: Options Exist for Meeting Requirements While Acquiring Fewer C-17s, 40.

<sup>50</sup>"Defense Transportation – Among Many Challenges, The Quest for Intransit Visibility," 4.

<sup>51</sup>"The Future Revisited," 5.

<sup>52</sup>"Air & Space Superiority in the Network-Centric Era," Lkd. Air Force Link at "Current News Page," ([http://www.af.mil/news/speech/current/Air\\_and\\_Space\\_Superiority\\_i.html](http://www.af.mil/news/speech/current/Air_and_Space_Superiority_i.html)/ > 12 December 1999), 1.

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<sup>53</sup>“Defense Transportation – Among Many Challenges, The Quest for Intransit Visibility,” 4.

<sup>54</sup>Daly, 3.

<sup>55</sup>Ibid.

<sup>56</sup>Beyer, 23.

<sup>57</sup>Howard, 22.

<sup>58</sup>Ibid.

<sup>59</sup>Donovan, 4.

<sup>60</sup>“An Introduction to the Expeditionary Aerospace Force,” 2.

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